



PENDING CLAIMS
for Interbody Spinal Fusion Implants
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33. A spinal fusion implant made of a material appropriate for human implantation into and across a disc space between two adjacent vertebral bodies, said implant comprising in combination:

a body having an exterior with opposed rigid portions adapted to be oriented toward the adjacent endplates of the two adjacent vertebral bodies and having a distance therebetween defining an implant height greater than the normal height of the disc space to be fused, each of said opposed rigid portions having at least one opening passing therethrough to allow bone growth from one of the adjacent vertebral bodies through said implant to the other of the adjacent vertebral bodies, said body being formed of an implantation material other than bone; and

a fusion promoting substance comprising bone morphogenetic protein.

34. The spinal fusion implant of claim 33, further comprising a protrusion extending from each of said opposed rigid portions for engaging each of the adjacent vertebral bodies to maintain said implant within the disc space.

35. The spinal fusion implant of claim 34, wherein said protrusion comprises a ridge.

36. The spinal fusion implant of claim 34, wherein said protrusion comprises a ratcheting.

37. The spinal fusion implant of claim 33, further comprising a plurality of ratchetings facing the same direction extending from each of said opposed rigid portions for engaging each of the adjacent vertebral bodies to maintain said implant within the disc space.

38. The spinal fusion implant of claim 33, further comprising a plurality of cells in said body for retaining said fusion promoting substance.
39. The spinal fusion implant of claim 33, wherein said opposed rigid portions have a porous surface.
40. The spinal fusion implant of claim 33, wherein said implantation material is porous.
41. The spinal fusion implant of claim 33, wherein said implant is treated with said fusion promoting substance.
42. The spinal fusion implant of claim 33, wherein said implant is coated with said fusion promoting substance.
43. The spinal fusion implant of claim 33, wherein said fusion promoting substance is contained within said implant.
44. The spinal fusion implant of claim 33, wherein said opposed rigid portions have a bone ingrowth surface.
45. The spinal fusion implant of claim 33, wherein said implantation material is stronger than bone.
46. The spinal fusion implant of claim 33, wherein each of said opposed rigid portions comprises an interior surface, said interior surfaces being spaced apart to define a hollow interior in communication with said at least one opening of each of said opposed rigid portions.
47. The spinal fusion implant of claim 46, wherein said implant has a leading end for insertion into the spine and an opposite trailing end, at least one of said ends being open to allow access to said hollow interior.

48. The spinal fusion implant of claim 47, wherein said at least one end providing access to said hollow interior of said implant is adapted to be closed by a cap.

49. The spinal fusion implant of claim 48, wherein said implant having said at least one end providing access to said hollow interior is in combination with a cap adapted to close said hollow interior.

50. The spinal fusion implant of claim 33, in combination with bone.

51. The spinal fusion implant of claim 50, wherein said bone is compressively loaded in said implant.

52. The spinal fusion implant of claim 33, in combination with hydroxyapatite.

53. The spinal fusion implant of claim 33, wherein said opposed rigid portions are arcuate.

54. A spinal fusion implant made of a material appropriate for human implantation into and across a disc space between two adjacent vertebral bodies, said implant comprising in combination:

a body having an exterior with opposed rigid arcuate portions adapted to be oriented toward the adjacent endplates of the two adjacent vertebral bodies, said opposed rigid arcuate portions having the same radius, each of said opposed rigid arcuate portions having at least one opening passing therethrough to allow bone growth from one of the adjacent vertebral bodies through said implant to the other of the adjacent vertebral bodies, said body being formed of an implantation material other than bone; and

a fusion promoting substance comprising bone morphogenetic protein.

55. The spinal fusion implant of claim 54, further comprising a protrusion extending from each of said opposed rigid portions for engaging each of the adjacent vertebral bodies to maintain said implant within the disc space.
56. The spinal fusion implant of claim 55, wherein said protrusion comprises a ridge.
57. The spinal fusion implant of claim 55, wherein said protrusion comprises a ratcheting.
58. The spinal fusion implant of claim 54, further comprising a plurality of ratchetings facing the same direction extending from each of said opposed rigid portions for engaging each of the adjacent vertebral bodies to maintain said implant within the disc space.
59. The spinal fusion implant of claim 54, further comprising a plurality of cells in said body for retaining said fusion promoting substance.
60. The spinal fusion implant of claim 54, wherein said opposed rigid portions have a porous surface.
61. The spinal fusion implant of claim 54, wherein said implantation material is porous.
62. The spinal fusion implant of claim 54, wherein said implant is treated with said fusion promoting substance.
63. The spinal fusion implant of claim 54, wherein said implant is coated with said fusion promoting substance.
64. The spinal fusion implant of claim 54, wherein said fusion promoting substance is contained within said implant.
65. The spinal fusion implant of claim 54, wherein said opposed rigid portions have a bone ingrowth surface.

66. The spinal fusion implant of claim 54, wherein said implantation material is stronger than bone.

67. The spinal fusion implant of claim 54, wherein each of said opposed rigid portions comprises an interior surface, said interior surfaces being spaced apart to define a hollow interior in communication with said at least one opening of each of said opposed portions.

68. The spinal fusion implant of claim 67, wherein said implant has a leading end for insertion into the spine and an opposite trailing end, at least one of said ends being open to allow access to said hollow interior.

69. The spinal fusion implant of claim 68, wherein said at least one end providing access to said hollow interior of said implant is adapted to be closed by a cap.

70. The spinal fusion implant of claim 69, wherein said implant having said at least one end providing access to said hollow interior is in combination with a cap adapted to close said hollow interior.

71. The spinal fusion implant of claim 54, in combination with bone.

72. The spinal fusion implant of claim 71, wherein said bone is compressively loaded in said implant.

73. The spinal fusion implant of claim 54, in combination with hydroxyapatite.

74. The spinal fusion implant of claim 54, wherein said implant has a height greater than the disc space between the two adjacent vertebral bodies to be fused.

75. A spinal fusion implant made of a material appropriate for human implantation into and across a disc space between two adjacent vertebral bodies, said implant comprising in combination:

a body having an exterior with opposed rigid arcuate portions adapted to be oriented toward the adjacent endplates of the two adjacent vertebral bodies and having a distance therebetween defining an implant height greater than the normal height of the disc space to be fused, said opposed arcuate rigid portions having the same radius, each of said opposed arcuate portions having at least one opening passing therethrough to allow bone growth from one of the adjacent vertebral bodies through said implant to the other of the adjacent vertebral bodies;

a plurality of surface roughenings protruding from said exterior of said body adapted to engage the two adjacent vertebral bodies to maintain said implant in place, said surface roughenings configured to resist expulsion of said implant from between the two adjacent vertebral bodies, said body being formed of an implantation material other than bone; and

a fusion promoting substance comprising bone morphogenetic protein.

76. The spinal fusion implant of claim 75, wherein said surface roughenings include knurling.

77. The spinal fusion implant of claim 75, further comprising a protrusion extending from each of said opposed rigid portions for engaging each of the adjacent vertebral bodies to maintain said implant within the disc space.

78. The spinal fusion implant of claim 77, wherein said protrusion comprises a ridge.

79. The spinal fusion implant of claim 77, wherein said protrusion comprises a ratcheting.

80. The spinal fusion implant of claim 75, further comprising a plurality of ratchetings facing the same direction extending from each of said opposed rigid portions for

engaging each of the adjacent vertebral bodies to maintain said implant within the disc space.

81. The spinal fusion implant of claim 75, further comprising a plurality of cells in said body for retaining said fusion promoting substance.

82. The spinal fusion implant of claim 75, wherein said opposed rigid portions have a porous surface.

83. The spinal fusion implant of claim 75, wherein said implantation material is porous.

84. The spinal fusion implant of claim 75, wherein said implant is treated with said fusion promoting substance.

85. The spinal fusion implant of claim 75, wherein said implant is coated with said fusion promoting substance.

86. The spinal fusion implant of claim 75, wherein said fusion promoting substance is contained within said implant.

87. The spinal fusion implant of claim 75, wherein said opposed rigid portions have a bone ingrowth surface.

88. The spinal fusion implant of claim 75, wherein said implantation material is stronger than bone.

89. The spinal fusion implant of claim 75, wherein each of said opposed rigid portions comprises an interior surface, said interior surfaces being spaced apart to define a hollow interior in communication with said at least one opening of each of said opposed portions.

90. The spinal fusion implant of claim 89, wherein said implant has a leading end for insertion into the spine and an opposite trailing end, at least one of said ends being open to allow access to said hollow interior.

91. The spinal fusion implant of claim 90, wherein said at least one end providing access to said hollow interior of said implant is adapted to be closed by a cap.

92. The spinal fusion implant of claim 91, wherein said implant having said at least one end providing access to said hollow interior is in combination with a cap adapted to close said hollow interior.

93. The spinal fusion implant of claim 75, in combination with bone.

94. The spinal fusion implant of claim 93, wherein said bone is compressively loaded in said implant.

95. The spinal fusion implant of claim 75, in combination with hydroxyapatite.

96. A spinal fusion implant made of a material appropriate for human implantation into and across a disc space between two adjacent vertebral bodies, said implant comprising:

a body having an exterior with opposed rigid arcuate portions adapted to be oriented toward the adjacent endplates of the two adjacent vertebral bodies, each of said opposed arcuate portions having at least one opening passing therethrough to allow bone growth from one of the two adjacent vertebral bodies through said implant to the other of the two adjacent vertebral bodies;

a plurality of surface projections on said exterior of said body adapted to engage the vertebral bodies to maintain said implant in place; and

a fusion promoting substance comprising bone morphogenetic protein.

97. The spinal fusion implant of claim 96, wherein said surface projections include a plurality of annular ratchetings defined around said body to resist expulsion of said implant from between the adjacent vertebral bodies.

98. The spinal fusion implant of claim 96, wherein said projections comprise a ridge.

99. The spinal fusion implant of claim 96, wherein said projections comprise a ratcheting.

100. The spinal fusion implant of claim 99, wherein said ratchetings face the same direction and extend from each of said opposed portions for engaging each of the adjacent vertebral bodies to maintain said implant within the disc space.

101. The spinal fusion implant of claim 96, further comprising a plurality of cells in said body for retaining said fusion promoting substance.

102. The spinal fusion implant of claim 96, wherein said opposed portions have a porous surface.

103. The spinal fusion implant of claim 96, wherein said implantation material is porous.

104. The spinal fusion implant of claim 96, wherein said implant is treated with said fusion promoting substance.

105. The spinal fusion implant of claim 96, wherein said implant is coated with said fusion promoting substance.

106. The spinal fusion implant of claim 96, wherein said fusion promoting substance is contained within said implant.

107. The spinal fusion implant of claim 96, wherein said opposed portions have a bone ingrowth surface.

108. The spinal fusion implant of claim 96, wherein said implantation material is stronger than bone.

109. The spinal fusion implant of claim 96, wherein each of said opposed portions comprises an interior surface, said interior surfaces being spaced apart to define a hollow interior in communication with said at least one opening of each of said opposed portions.

110. The spinal fusion implant of claim 109, wherein said implant has a leading end for insertion into the spine and an opposite trailing end, at least one of said ends being open to allow access to said hollow interior.

111. The spinal fusion implant of claim 110, wherein said at least one end providing access to said hollow interior of said implant is adapted to be closed by a cap.

112. The spinal fusion implant of claim 111, wherein said implant having said at least one end providing access to said hollow interior is in combination with a cap adapted to close said hollow interior.

113. The spinal fusion implant of claim 96, in combination with bone.

114. The spinal fusion implant of claim 113, wherein said bone is compressively loaded in said implant.

115. The spinal fusion implant of claim 96, in combination with hydroxyapatite.

116. The spinal fusion implant of claim 96, wherein said implant has a height greater than the disc space between the two adjacent vertebral bodies to be fused.